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# **Reported Sexually Transmitted Infections in the Department of Navy: Annual Report 2018**

NMCPHC-EDC-TR-120-2019

## Background

Sexually transmitted infections (STIs) are comprised of several bacterial, viral, and parasitic infections, including chlamydia, gonorrhea, syphilis, human immunodeficiency virus (HIV), herpes simplex virus (HSV), human papillomavirus (HPV), and trichomoniasis. The Department of Navy (DON) case definitions for reportable STIs are established in the Armed Forces Reportable Medical Event (AFRME) Guidelines and Case Definitions (July 2017).<sup>1</sup> DON policy and procedures for medical event surveillance are directed by Bureau of Medicine and Surgery (BUMED) instruction 6220.12C.<sup>2</sup> In accordance with DON policy, STIs are reported through the Disease Reporting System-Internet (DRSi), the Department of Defense's official web-based reporting tool. Chlamydia, syphilis, and gonorrhea are the only reportable STIs per the AFRME guidelines and case definitions.<sup>1</sup>

According to the Centers for Disease Control and Prevention (CDC), in recent years the United States (US) has seen an unprecedented uptick in reported STIs.<sup>3</sup> Chlamydia remains the most frequently reported notifiable disease in the US.<sup>3</sup> Asymptomatic infection is common among both men and women.<sup>4</sup> Several important sequelae can result from untreated *Chlamydia trachomatis* infection including pelvic inflammatory disease (PID), ectopic pregnancy, and infertility.<sup>4</sup> Chlamydia case rates for females are typically much higher than males because females are more likely to be screened for chlamydia during routine health assessments.<sup>3</sup> There were 1.71 million chlamydial infections reported to the CDC in 2017.<sup>3</sup> The rate of reported cases during 2017 in the US was 528.8 per 100,000 population, which was an increase of about 6.9% compared to the 2016 rate. The rate for females was approximately twice the rate for males (687.4 vs. 363.1 per 100,000 population).<sup>3</sup>

Gonorrhea is the second most frequently reported notifiable disease in the US according to the CDC.<sup>5</sup> Sequelae resulting from infection with *Neisseria gonorrhoeae* are similar to those from chlamydia, and include PID, ectopic pregnancy, and infertility. Drug resistant strains of gonorrhea are increasingly detected worldwide; as a result, in 2015 the CDC revised treatment guidelines recommended dual treatment therapy.<sup>5</sup> Under-reporting is also common with gonorrhea infections; there are an estimated 820,000 cases in the US each year with approximately half of the cases reported to the CDC.<sup>6</sup> In 2017, 555,608 cases were reported. This corresponds with a rate of 171.9 gonorrhea cases per 100,000 population, an increase of 18.6% since 2016.<sup>5</sup>

Syphilis, a genital ulcerative disease, remains a significant problem in the US. Syphilis, caused by the bacterium *Treponema pallidum*, can cause severe disease if inadequately treated; adverse



outcomes include perinatal death or infection of the infant if syphilis goes untreated in pregnant women.<sup>7</sup> The stages of syphilis consist of a primary and secondary stage (P&S), which are both symptomatic, a latent stage occurring when the symptoms have disappeared, and finally, if left untreated, a late symptomatic phase that occurs 10-30 years after infection.<sup>8</sup> In 2017, a total of 101,567 cases of syphilis were reported to the CDC, the highest total case count of reported syphilis since 1993. Of these reported cases, 30,644 were P&S syphilis, with a rate of 9.5 cases per 100,000 population. This represents an increase of 10.5% above 2016 reports.<sup>7</sup> Between 2000 and 2017, the rate of P&S syphilis has consistently increased, largely driven by an increase among men who have sex with men. The increase of P&S syphilis among women has been associated with an increase in congenital syphilis; from 2016 to 2017, congenital syphilis rose by 27.6% to 23.3 cases per 100,000 live births.<sup>7</sup>

The EpiData Center (EDC) Department at the Navy and Marine Corps Public Health Center (NMCPHC) completes this annual STI report, which examines data trends for chlamydia, gonorrhea, and syphilis among active duty (AD) service members in the DON. The key stakeholders for this report are the Population Health and Preventive Medicine (PM) Directorates of NMCPHC, preventive medicine technicians (PMTs) at local military treatment facilities (MTFs), and Navy Environmental Preventative Medicine Units (NEPMUs) among others.

## Methods

The DRSi database was queried for unique medical event reports (MERs) for chlamydia, gonorrhea, and syphilis reported in 2018. Using the 2017 total AD population of the Navy and Marine Corps supplied by Defense Medical Epidemiology Database (DMED), case rates per 100,000 AD DON service members were calculated to determine disease burden. Recruits were omitted from this report; they were defined as those with a grade of E1 with a MER from Parris Island, Beaufort, Great Lakes, or San Diego.

### *Case Definitions*

A case was defined as a chlamydia, gonorrhea, or syphilis confirmed MER in the DRSi database for an AD Navy or Marine Corps service member. If the same individual was reported to the database multiple times for the same disease, each case must have been separated by at least 30 days to have been considered a unique case.



## Results

### Chlamydia – 2018

In the Navy and Marine Corps, as in the US general population, chlamydial genital infection is the most frequently reported STI.<sup>3</sup> In 2018, the overall rate of chlamydia was 1,531.9 per 100,000 population for AD Sailors compared to 1,521.8 in 2017. For Marines, the rate of chlamydia in 2018 was 1,988.4 per 100,000 population compared to 1,990.6 in 2017. There were 8,534 chlamydia cases reported among DON AD service members in 2018; 4,881 Navy cases and 3,653 Marine Corps cases.

Table 1 illustrates the chlamydia counts and rates among AD Navy service members by sex and age group. Of the Navy reported cases, 2,029 were female and 2,852 were male. The overall rate of chlamydia for AD Sailors was 1,531.9 per 100,000 population. Potentially due to screening policies, rates are higher among females than males in all but one age group. The highest rate is observed in female Sailors aged 15-19 at 6,850.5 per 100,000 population. Figure 1 shows a comparison of the US Navy chlamydia rates compared to US population rates (CDC).<sup>4</sup> Across age groups and sex, rates of reported chlamydia among AD Navy service members are consistently higher than rates of the total US population.

**Table 1. Counts and Rates of Chlamydia among Active Duty Navy Service Members, 2018**

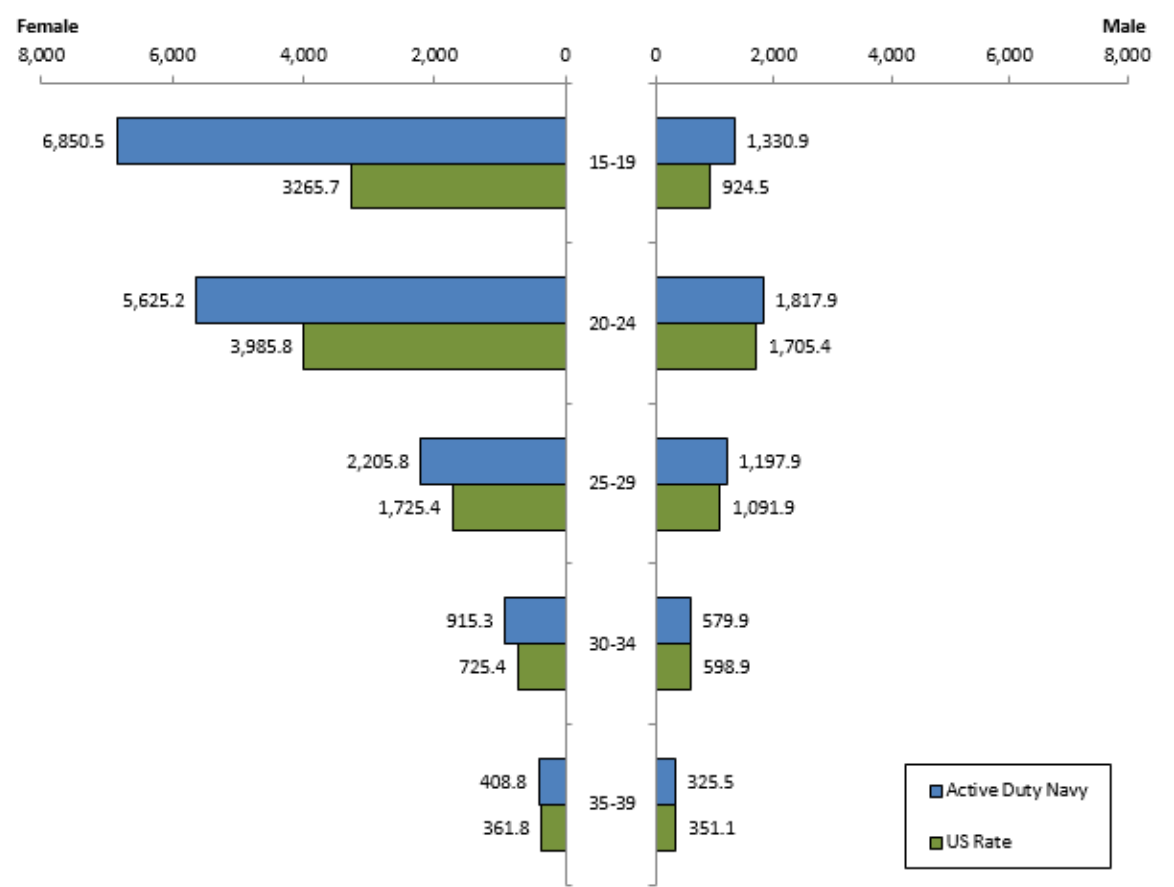
		Age Group						Total
Count	Sex	15-19	20-24	25-29	30-34	35-39	40+	
	Female	323	1,247	350	80	22	7	2,029
	Male	165	1,450	774	264	106	93	2,852
	Total	488	2,697	1,124	344	128	100	4,881
Rate per 100,000	Female	6,850.5	5,625.2	2,205.8	915.3	408.8	180.3	3,339.7
	Male	1,330.9	1,817.9	1,197.9	579.9	325.5	321.6	1,105.9
	Total	2,851.5	2,808.7	1,396.6	633.9	337.3	304.9	1,531.9

Data Source: Disease Reporting System - Internet (DRSi) and Defense Medical Epidemiology Database (DMED).

Prepared by the EpiData Center Department, Navy and Marine Corps Public Health Center on 21 February 2019.



**Figure 1. Chlamydia Reporting Rates during 2018 among Active Duty Navy Service Members vs. 2017 US Rates**



Data Source: Disease Reporting System - Internet (DRSi) and Defense Medical Epidemiology Database (DMED).  
 Prepared by the EpiData Center Department, Navy and Marine Corps Public Health Center on 21 February 2019.

Table 2 shows the counts and rates of reported chlamydia cases among AD Marine Corps service members by sex and age group. Reported chlamydia cases for Marines were comprised of 909 females and 2,744 males. The overall rate of chlamydia for AD Marines in 2018 was 1,988.4 per 100,000. Females aged 20-24 had the highest rate of chlamydia at 7,872.9 per 100,000. However, in contrast to prior years, female Marines did not have the highest rates of chlamydia across all age groups. Male Marines aged 35-39 and 40+ had higher rates of reported chlamydia infection than female Marines in the same age groups. Figure 2 shows a comparison of the US Marine Corps chlamydia rates compared to US general population rates (CDC).<sup>4</sup>



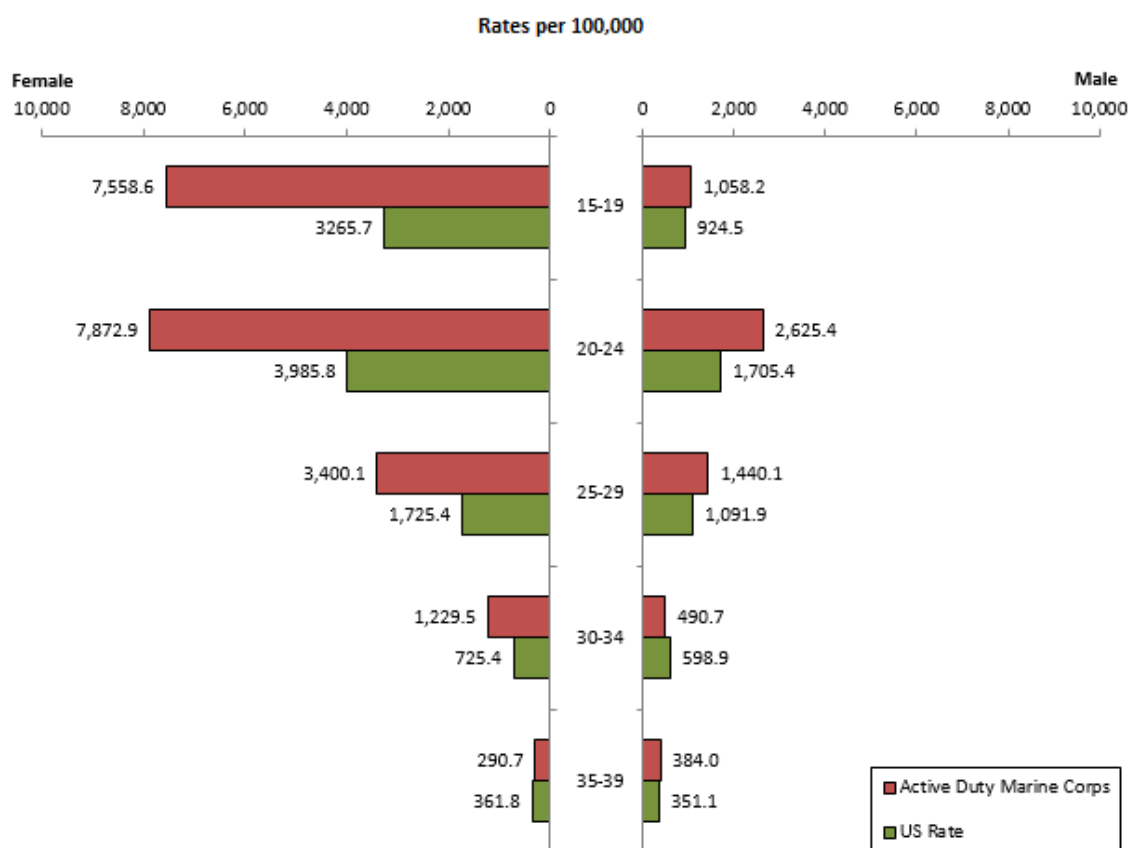
**Table 2.** Counts and Rates of Chlamydia among Active Duty Marine Corps Service Members, 2018

		Age Group						
Count	Sex	15-19	20-24	25-29	30-34	35-39	40+	Total
	Female	200	597	95	15	2	0	909
	Male	254	1,939	406	83	42	20	2,744
	Total	454	2,536	501	98	44	20	3,653
Rate per 100,000	Sex	15-19	20-24	25-29	30-34	35-39	40+	Total
	Female	7,558.6	7,872.9	3,400.1	1,229.5	290.7	0.0	5,945.8
	Male	1,058.2	2,625.4	1,440.1	490.7	384.0	232.1	1,629.2
	Total	1,703.7	2,903.4	1,616.8	540.4	378.5	222.9	1,988.4

Data Source: Disease Reporting System - Internet (DRSi) and Defense Medical Epidemiology Database (DMED).

Prepared by the EpiData Center Department, Navy and Marine Corps Public Health Center on 21 February 2019.

**Figure 2.** Chlamydia Reporting Rates during 2018 among Active Duty Marine Corps Service Members vs. 2017 US Rates



Data Source: Disease Reporting System - Internet (DRSi) and Defense Medical Epidemiology Database (DMED).

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## Gonorrhea – 2018

According to the most recent CDC estimates, the rate of gonorrhea infection in the United States is 171.9 per 100,000 population, an increase of 75.2% since a historic low in 2009.<sup>6</sup> Gonorrhea rates in the DON are also on the rise. In 2018, the rate among Navy female service members was 302.9 per 100,000 population, an increase over the 2017 rate of 260.8 per 100,000 population. The rate among female Marines was 490.6 per 100,000 population in 2018 compared to 408.8 per 100,000 population in 2017. Gonorrhea cases among DON AD service members totaled 1,323 during 2018; of these, 826 cases were among Sailors and 497 were among Marines.

Table 3 illustrates the counts and rates of gonorrhea in AD Navy service members by sex and age group. Of the Navy cases, 184 were female and 642 were male. The overall gonorrhea rate for the Navy was 259.2 per 100,000 population. Potentially due to screening policies, females aged 20-24 had the highest rates of gonorrhea during 2018, at 509.7 per 100,000 population. Figure 3 shows a comparison of the Navy gonorrhea rates compared to the US general population (CDC).<sup>6</sup>

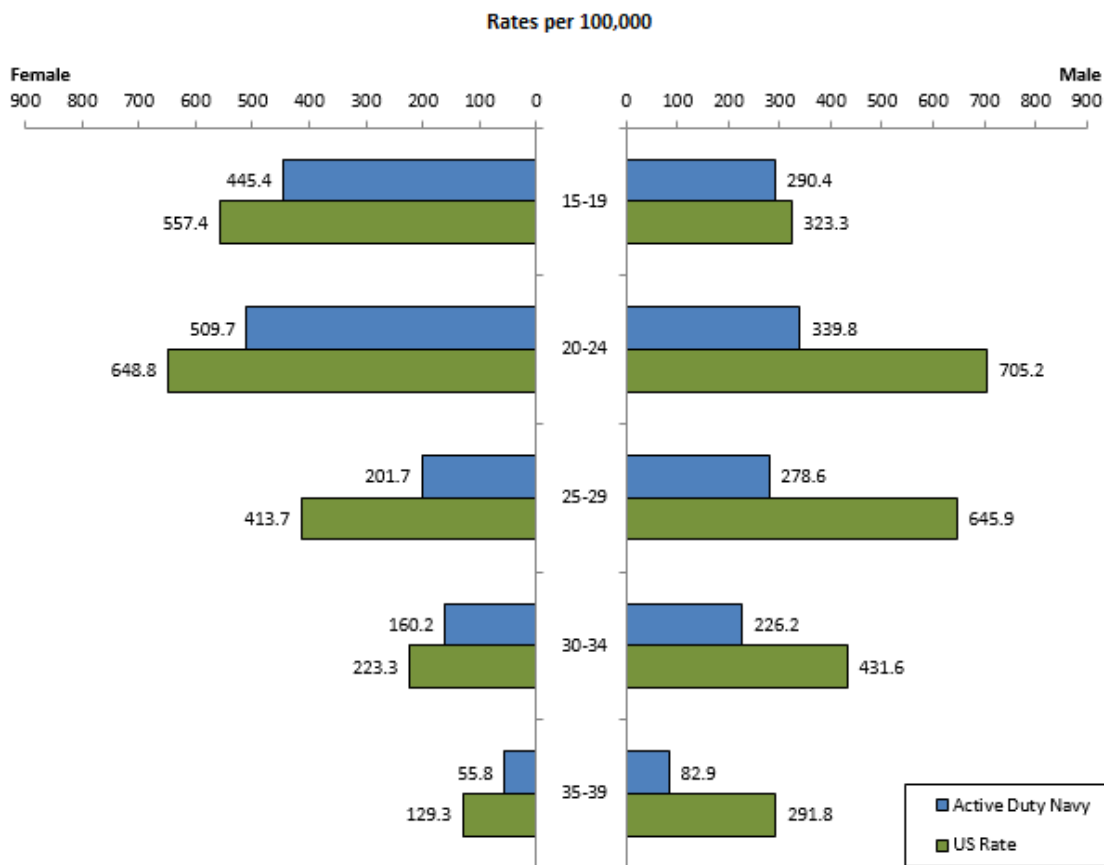
**Table 3.** Counts and Rates of Gonorrhea among Active Duty Navy Service Members, 2018

		Age Group						Total
Count	Sex	15-19	20-24	25-29	30-34	35-39	40+	
	Female	21	113	32	14	3	1	184
	Male	36	271	180	103	27	25	642
	Total	57	384	212	117	30	26	826
Rate per 100,000	Female	445.4	509.7	201.7	160.2	55.8	25.8	302.9
	Male	290.4	339.8	278.6	226.2	82.9	86.5	249.0
	Total	333.1	399.9	263.4	215.6	79.0	79.3	259.2

Data Source: Disease Reporting System - Internet (DRSi) and Defense Medical Epidemiology Database (DMED).  
 Prepared by the EpiData Center Department, Navy and Marine Corps Public Health Center on 25 February 2019.



**Figure 3. Gonorrhea Reporting Rates during 2018 among Active Duty Navy Service Members vs. 2017 US Rates**



Data Source: Disease Reporting System - Internet (DRSi) and Defense Medical Epidemiology Database (DMED).  
 Prepared by the EpiData Center Department, Navy and Marine Corps Public Health Center on 25 February 2019.

Reported cases of gonorrhea among Marines increased 26.8% in comparison to 2017; cases were comprised of 75 females and 422 males. Table 4 shows the Marine Corps counts and rates of gonorrhea cases by sex and age group. The overall rate of gonorrhea for the Marine Corps was 270.5 per 100,000 population, with females aged 20-24 having the highest rate at 685.7 per 100,000 population. Figure 4 shows a comparison of the Marine Corps gonorrhea rates compared to US general population (CDC).<sup>6</sup>





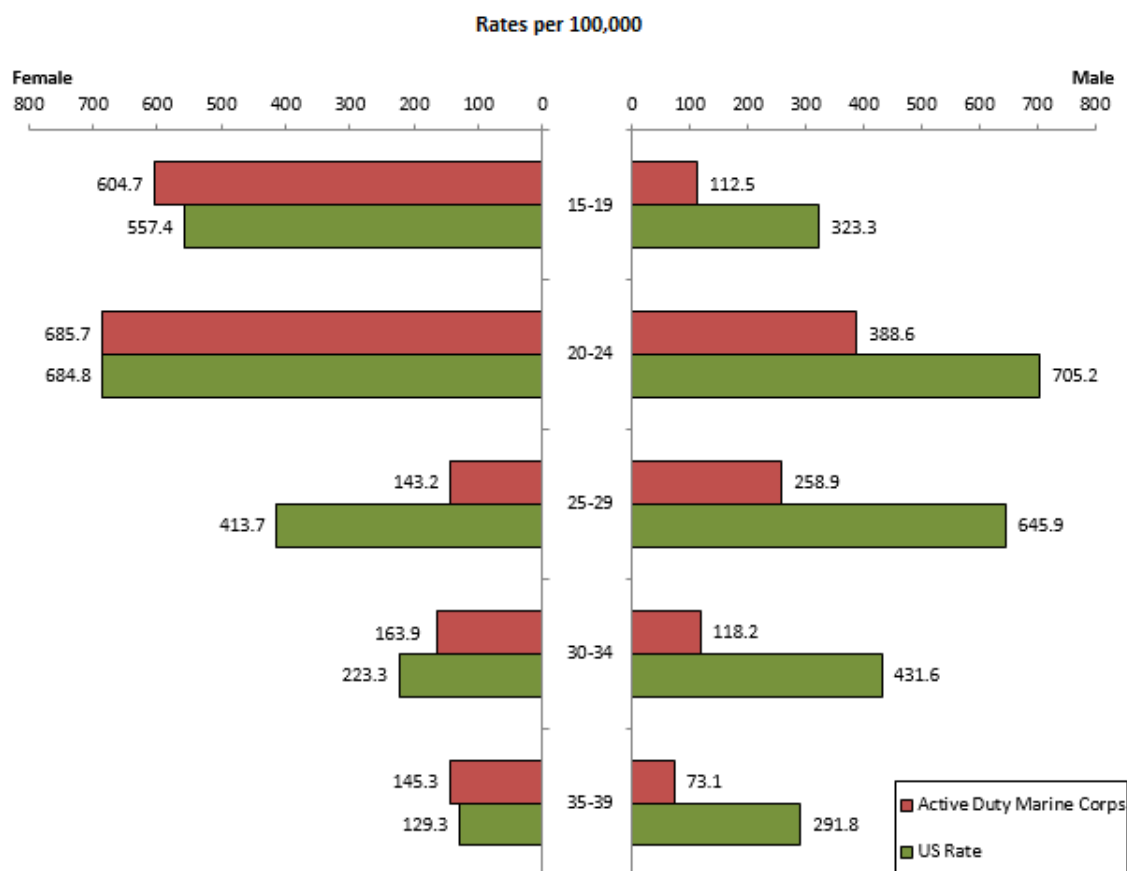
**Table 4. Counts and Rates of Gonorrhea among Active Duty Marine Corps Service Members, 2018**

		Age Group						
Count	Sex	15-19	20-24	25-29	30-34	35-39	40+	Total
	Female	16	52	4	2	1	0	75
	Male	27	287	73	20	8	7	422
	Total	43	339	77	22	9	7	497
Rate per 100,000	Sex	15-19	20-24	25-29	30-34	35-39	40+	Total
	Female	604.7	685.7	143.2	163.9	145.3	0.0	490.6
	Male	112.5	388.6	258.9	118.2	73.1	81.2	250.6
	Total	161.4	388.1	248.5	121.3	77.4	78.0	270.5

Data Source: Disease Reporting System - Internet (DRSi) and Defense Medical Epidemiology Database (DMED).

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**Figure 4. Gonorrhea Reporting Rates during 2018 among Active Duty Marine Corps Service Members vs. 2017 US Rates**



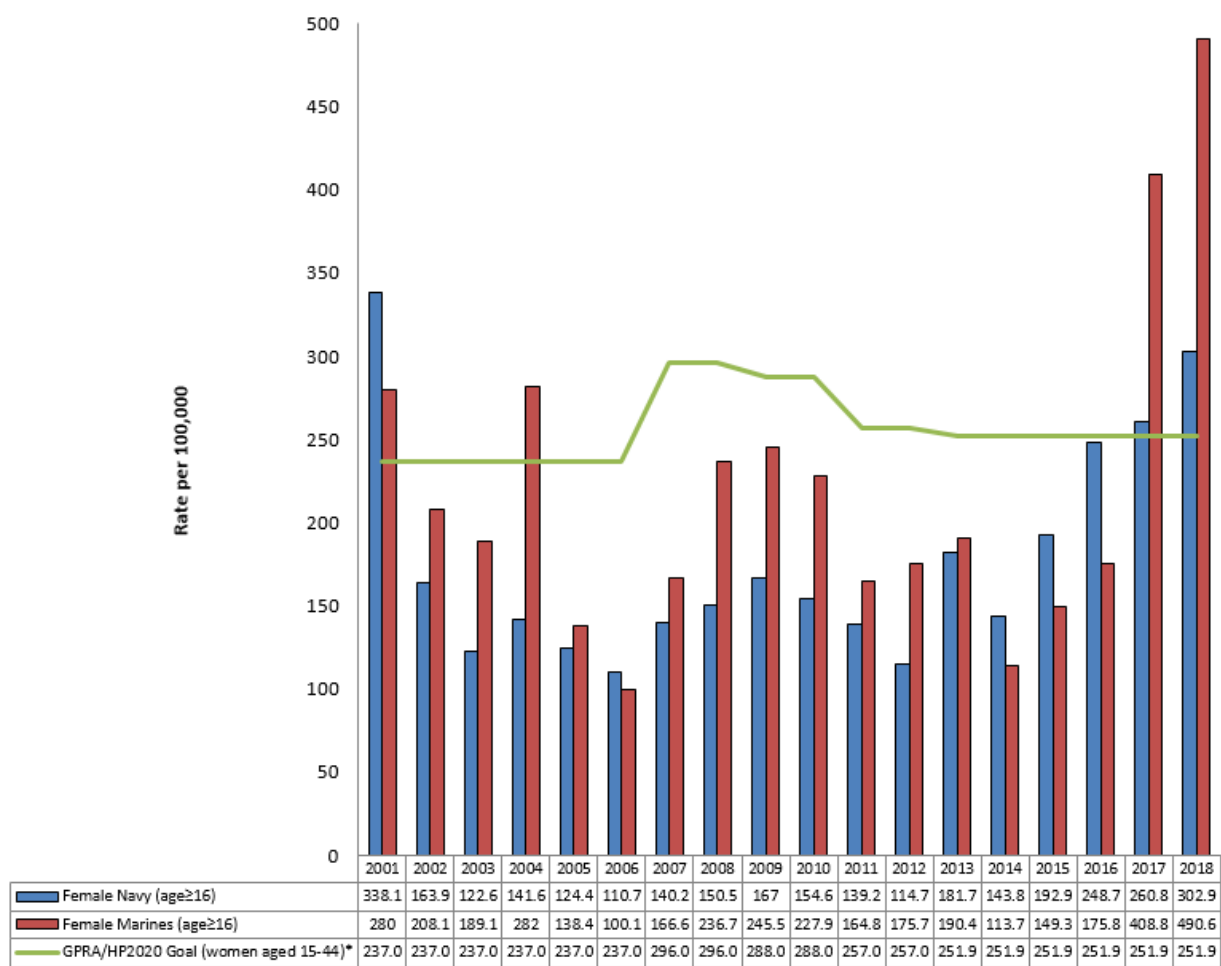
Data Source: Disease Reporting System - Internet (DRSi) and Defense Medical Epidemiology Database (DMED).

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Figure 5 shows a comparison of Navy and Marine Corps female gonorrhea rates versus the Government Performance and Results Act (GPRA) and Healthy People 2020 (HP2020) goals. In 2018, the rates per 100,000 population for female Sailors and Marines were 302.9 and 490.6, both of which exceed the revised Healthy People 2020 goal of 251.9. The rate of reported gonorrhea among female Marines increased 20% from the year prior.

**Figure 5.** Gonorrhea Rates among Female Active Duty Sailors and Marines Compared to Healthy People 2020 Goals, 2001 - 2018



Data Source: Disease Reporting System - Internet (DRSi) and Defense Medical Epidemiology Database (DMED).

\*Note that the goal line is based on Government Performance and Results Act (GPRA) goals from 2001 - 2010 and Healthy People 2020 goals from 2011 - 2018. HP2020 goal line was adjusted in 2013.

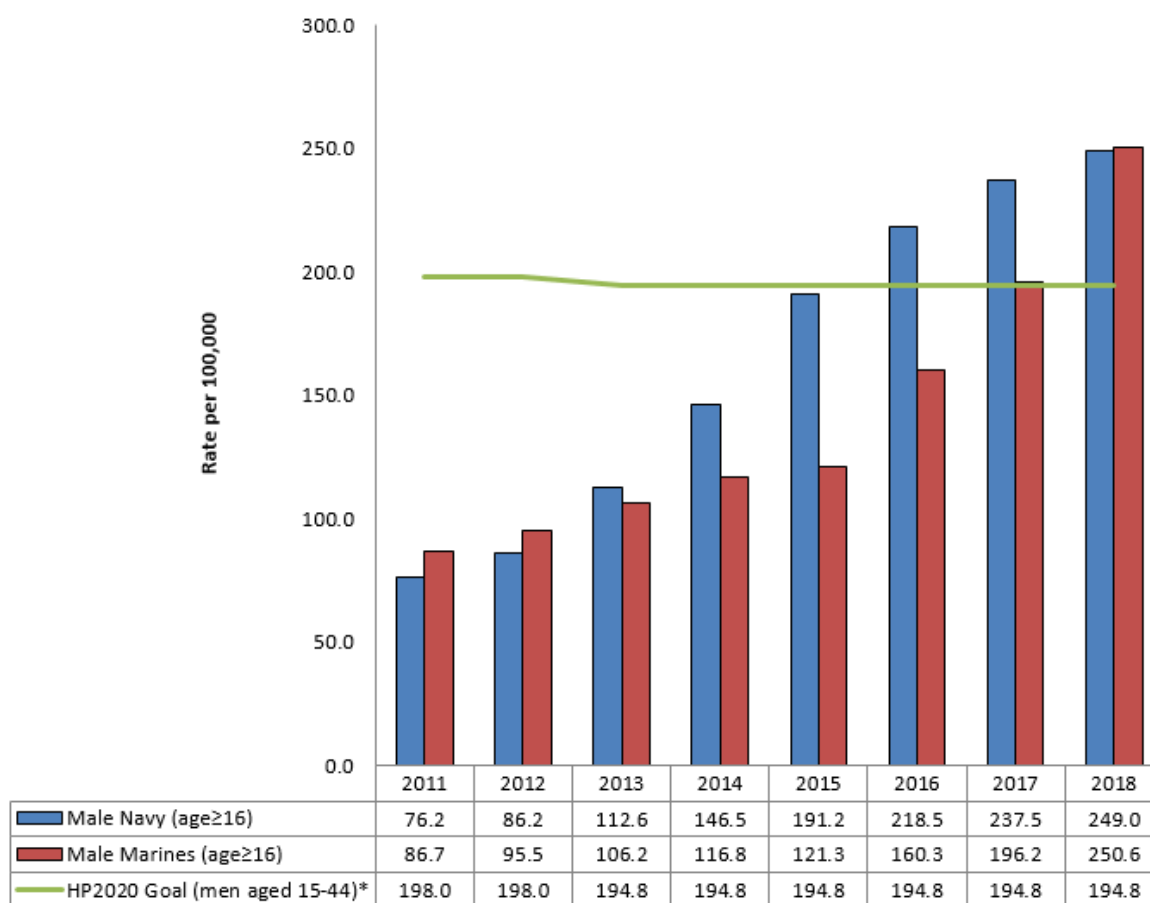
Healthy People 2020 Goal (Table B1)<sup>10</sup>

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Revisions to Healthy People 2020 goals now include an indicator for gonorrhea reports among males.<sup>10</sup> Figure 6 shows a comparison of gonorrhea rates for Navy and Marine Corps males versus the Healthy People 2020 goal (no GPRA goals available). In 2018, the rates per 100,000 population for male Sailors and Marines were 249.0 and 250.6, respectively. Notably in 2018, the rate of gonorrhea per 100,000 population among both AD male Sailors and Marines was higher than the Healthy People 2020 goal of 194.8.

**Figure 6. Gonorrhea Rates among Male Active Duty Sailors and Marines Compared to Healthy People 2020 Goals, 2011-2018**



Data Source: Disease Reporting System - Internet (DRSi) and Defense Medical Epidemiology Database (DMED).

\*Note that the goal line is based on Healthy People 2020 goals. HP2020 goal line was adjusted in 2013.

Healthy People 2020 Goal (Table B1)<sup>10</sup>

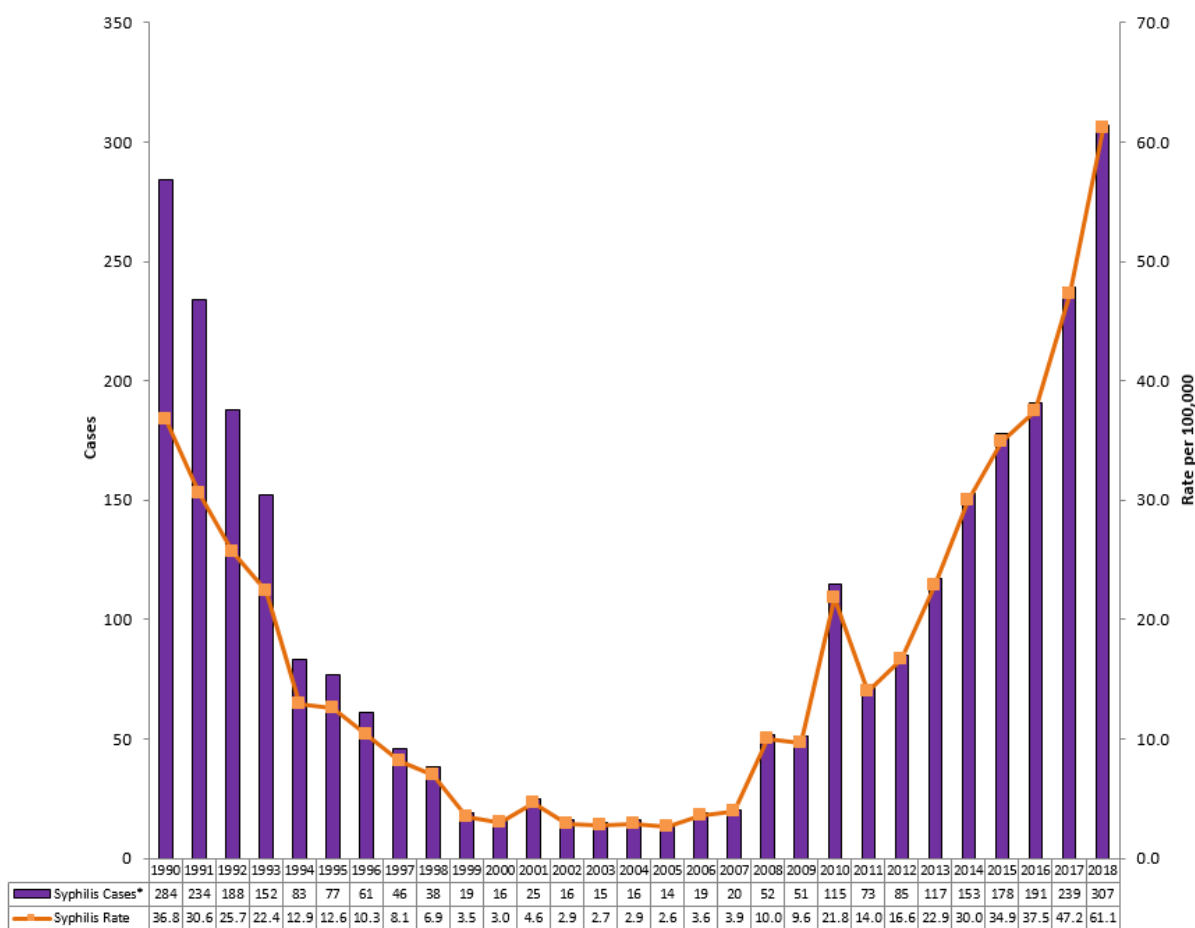
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## Syphilis – 2018

Overall, there were 307 reported syphilis cases (all stages) among DON AD service members in 2018; 235 in the Navy and 72 in the Marine Corps. The Navy cases included five females and 230 males. The Marine Corps cases included five females and 67 males. Figure 7 shows the trends in syphilis counts for AD Navy and Marine Corps service members from 1990 to 2018. Consistent with syphilis trends in the US, the overall syphilis rate for AD Navy and Marine Corps service members reached its highest point in 2018 with a rate 61.1 per 100,000 population. It should be noted that the counts in Figure 7 include all stages of syphilis. In 2018, 44.6% of reported cases indicated P&S syphilis (n=137), 33.6% were latent (n=103), 3.6% were tertiary (n=11), and 18.2% had an unknown stage (n=56).

**Figure 7. Syphilis Cases and Rates\*, Active Duty Navy and Marine Corps Service Members, 1990 - 2018**



Data Source: Disease Reporting System - Internet (DRSi) and Defense Medical Epidemiology Database (DMED).

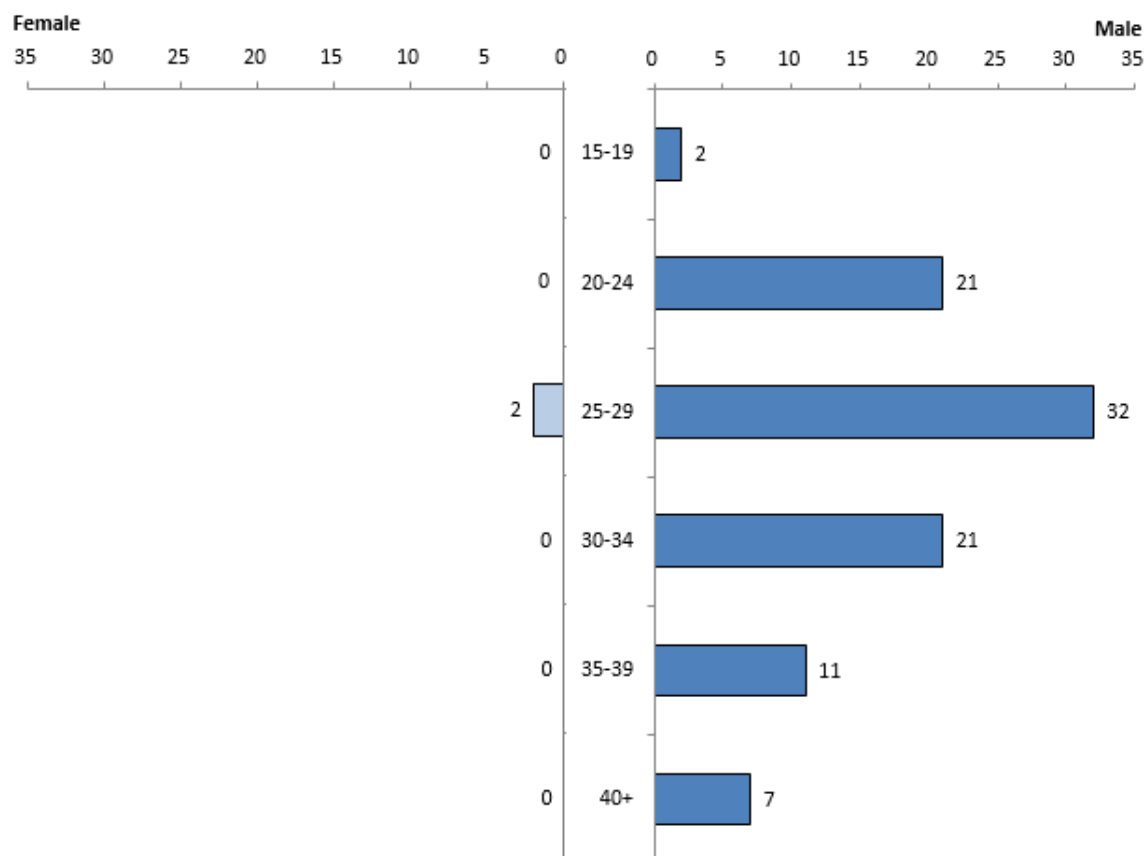
\*Note that data includes primary, secondary, tertiary, latent, and unknown stages of syphilis.

Prepared by the EpiData Center Department, Navy and Marine Corps Public Health Center on 25 February 2019.



Figures 8 and 9 show the count of P&S syphilis by age and sex among AD Navy and Marine Corps service members. Among AD Navy service members in 2018, the overall case count of P&S syphilis was 96, with the highest count among males aged 25-29 at 32 cases. Among AD Marine Corps service members the overall case count of P&S syphilis was 39, with the highest count among males aged 20-24 at 21 cases.

**Figure 8. Count of Primary and Secondary Syphilis by Sex and Age Group, Active Duty Navy Service Members, 2018**

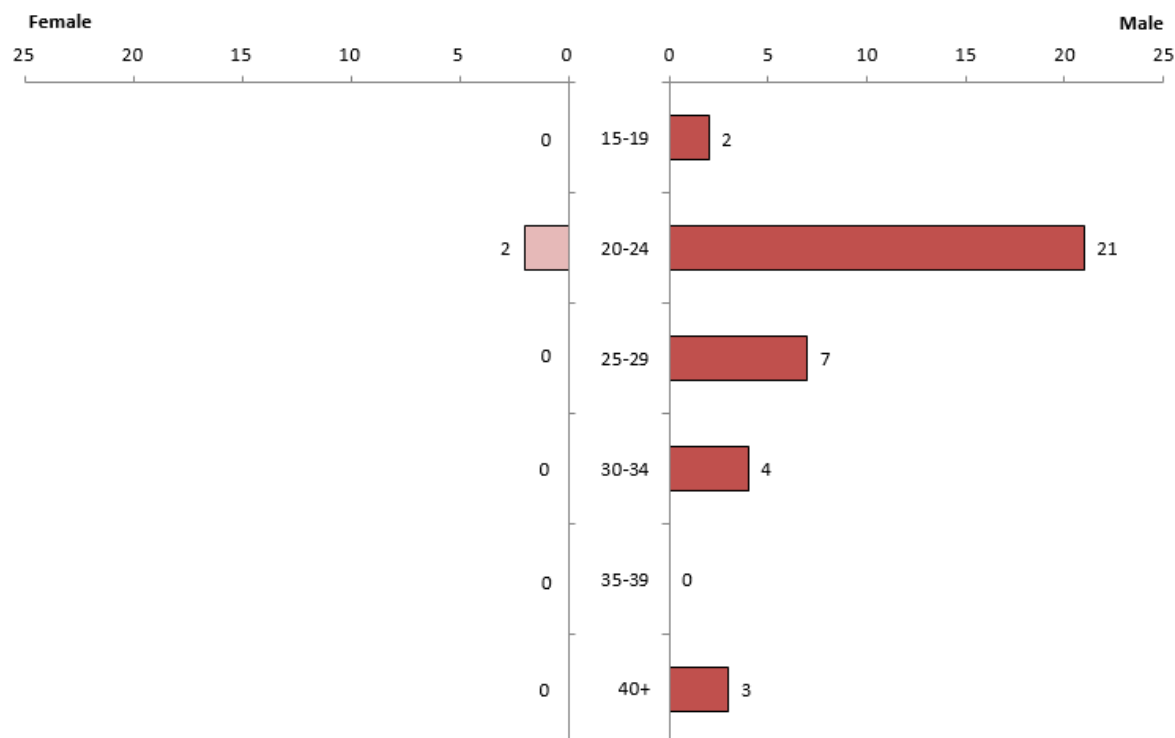


Data Source: Disease Reporting System - Internet (DRSi).

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**Figure 9. Count of Primary and Secondary Syphilis by Sex and Age Group, Active Duty Marine Corps Service Members, 2018**



Data Source: Disease Reporting System - Internet (DRSi)

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## Limitations

DRSi is a passive medical reporting system dependent upon DRSi recorders to document Armed Forces reportable events in the system on a case-by-case basis; therefore, underreporting is likely for most routine medical events including STIs. MER completeness and validity is reliant upon accurate data entry by DRSi recorders, usually PMTs, tasked with completing MERs at the local command level. Syphilis data, specifically syphilis stage, may be particularly affected by incomplete reporting. Internet access is required to submit a MER, so the time from the event to entry into DRSi may be delayed, especially events discovered at sea or when deployed. Reportable medical events identified outside of the Military Health System, such as purchased care visits, will not be recorded in DRSi unless the case is reported to a local MTF.

Due to available fields in the DRSi database, recruits were identified using a rank of E1 and a MER reported from Parris Island, Beaufort, Great Lakes or San Diego. This method is determined to be the most reliable for the identification and removal of DRSi recruit records for this report.





Denominator data for this report are available through DMED. The aggregate AD population data is available on a one to two year lag, making 2017 the most recent complete year.



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